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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,305	11/14/2006	Nancy Dean	H0004275.84418 US2 - 4018	6412
63993 7590 01/07/2009 BUCHALTER NEMER 18400 VON KARMAN AVE. SUITE 800 IRVINE, CA 92612				
EXAMINER COLEMAN, WILLIAM D				
ART UNIT		PAPER NUMBER		
2823				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/551,305

**Applicant(s)**

DEAN ET AL.

**Examiner**

W. David Coleman

**Art Unit**

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13, 15-27 and 29-32 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-13, 15-27 and 29-32 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date 10/08; 11/08  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-13, 15-27 and 29-32 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

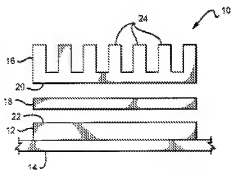
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-10, 13, 15-24, 27 and 29-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Roesner et al., U.S. Patent Application Publication 2003/0112603 A1.

Roesner discloses a semiconductor process as claimed. See **FIGS. 1-4**, where Roesner teaches the following limitations.



Pertaining to claim 1, Roesner teaches a thermal transfer material, comprising:

a heat spreader component, wherein the heat spreader component comprises a top

surface, a bottom surface and at least one heat spreader material, and at least one thermal interface material **18**, wherein the thermal interface material comprises a phase change material (please see paragraph [0019] where Roesner teaches various phase change materials) and wherein the thermal interface material is directly deposited onto at least part of the bottom surface of the heat spreader component.

Pertaining to claim 2, Roesner teaches the thermal transfer material of claim 1, wherein the thermal material is further coupled to a substrate **14**.

Pertaining to claim 3, Roesner teaches the thermal transfer material of claim 2, wherein the substrate comprises silicon (although Roesner does not use the term “silicon” Roesner teaches that the substrate may comprise any presently-known or future developed electronic component, it is well known that silicon is a electronic material).

Pertaining to claim 4, Roesner teaches the thermal transfer material of claim 1, wherein the thermal transfer material further comprises at least one adhesive component.

Pertaining to claim 5, Roesner teaches the thermal transfer material of claim 1, wherein the at least one adhesive component is coupled to the heat spreader component.

Pertaining to claim 6, Roesner teaches the thermal transfer material of claim 4, wherein the at least one adhesive component is coupled to the thermal interface material (because Roesner discloses PCM45 phase-change material sold by Honeywell, Inc., this limitation has been met).

Pertaining to claim 7, Roesner teaches the thermal transfer material of claim 4, wherein the at least one adhesive component is mixed into at least some of the thermal interface material.

Pertaining to claim 8, Roesner teaches the thermal transfer material of claim 1, wherein the heat spreader component comprises a metal, a metal-based material, a high-conductivity non-metal or combination thereof.

Pertaining to claim 9, Roesner teaches the thermal transfer material of claim 8, wherein the heat spreader component comprises nickel, aluminum, copper or a combination thereof.

Pertaining to claim 10, Roesner teaches the thermal transfer material of claim 9, wherein the metal-based material or high- conductive non-metal comprises silicon, carbon, copper, graphite, diamond or a combination thereof.

Pertaining to claim 13, Roesner teaches the thermal transfer material of claim 1, wherein the thermal interface material comprises a crosslinkable thermal interface material.

Pertaining to claim 15, Roesner teaches the thermal transfer material of claim 1, wherein the

thermal interface material comprises a polymer solder material, a polymer solder hybrid material or a combination thereof.

Pertaining to claim 16, Roesner teaches the thermal transfer material of claim 1, wherein the thermal interface material comprises a conductive filler, a metallic material, a solder alloy and combinations thereof.

Pertaining to claim 17, Roesner teaches a method of forming a thermal transfer material, comprising:

providing a heat spreader component, wherein the heat spreader component comprises a top surface, a bottom surface and at least one heat spreader material;

providing at least one thermal interface material, wherein the thermal interface material comprises a phase change material and wherein the thermal interface material is directly deposited onto the bottom surface of the heat spreader component; and

depositing the at least one thermal interface material onto the bottom surface of the heat spreader component.

Pertaining to claim 18, Roesner teaches the method of claim 17, wherein the thermal transfer material further comprises at least one adhesive component.

Pertaining to claim 19, Roesner teaches the method of claim 18, wherein the at least one adhesive component is coupled to the heat spreader component.

Pertaining to claim 20, Roesner teaches the method of claim 18, wherein the at least one adhesive component is coupled to the thermal interface material.

Pertaining to claim 21, Roesner teaches the method of claim 18, wherein the at least one adhesive component is mixed into at least of the thermal interface material.

Pertaining to claim 22, Roesner teaches the method of claim 17, wherein the heat spreader component comprises a metal, a metal-based material, a high-conductivity non-metal or a combination thereof.

Pertaining to claim 23, Roesner teaches the method of claim 22, wherein the heat spreader component comprises nickel, aluminum, copper or a combination thereof.

Pertaining to claim 24, Roesner teaches the method of claim 22, wherein the metal-based material or high- conductive nonmetal comprises silicon, carbon, copper, graphite, diamond or a combination thereof.

Pertaining to claim 27, Roesner teaches the method of claim 17, wherein the thermal interface material comprises a crosslinkable thermal interface material.

Pertaining to claim 29, Roesner teaches the method of claim 17, wherein the thermal interface

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material comprises a polymer solder material.

Pertaining to claim 30, Roesner teaches the method of claim 17, comprises a conductive filler, a metallic material, a solder alloy and combinations thereof.

Pertaining to claim 31, Roesner teaches a method for forming an IC package, comprising:  
providing the thermal transfer material of claim 1;  
providing at least one adhesive component; providing at least one surface or substrate;  
coupling the at least one thermal transfer material with the at least one adhesive component to form an adhesive unit; and coupling tile adhesive unit to the at least one surface or substrate to form a thermal package.

Pertaining to claim 32, Roesner teaches the method of claim 31, further comprising coupling an additional layer or component to the thermal package.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:



1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 10, 11, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roesner et al., U.S. Patent Application Publication 2003/0112603 A1.

Roesner teaches a semiconductor process substantially as claimed.

However, Roesner fails to teach the thermal transfer material wherein the heat spreader component comprises a thickness of about 0.25 mm to about 6 mm.

And Roesner fails to teach the thermal transfer material wherein the thickness is from about 0.5 mm to about 5 mm. Applicant has not disclosed that having the heat spreader with a claimed thickness of about 0.25 mm to about 6 mm and having a thermal transfer material with a thickness from about 0.5 mm to about 5 mm solves any stated problem or is for any particular purpose. Moreover, it appears that the heat spreader and thermal transfer material thickness of Roesner would perform equally well. Accordingly, the use of the claimed thicknesses is deemed to be a design consideration which fails to patentably distinguish over the prior art of Roesner.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. David Coleman  
Primary Examiner  
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